

EINGEGANGEN
Patentanwälte

- 1. März 2001

TIEDTKE · BÜHLING · KINNE
& PARTNER (GmbH)

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

To:

LESON, Thomas, Johannes, Alois
Tiedtke-Bähling-Kinne et al.
Bavariaring 4
D-80336 München
ALLEMAGNE

INFORMATION CONCERNING ELECTED
OFFICES NOTIFIED OF THEIR ELECTION

(PCT Rule 61.3)

Date of mailing (day/month/year) 21 February 2001 (21.02.01)		IMPORTANT INFORMATION	
Applicant's or agent's file reference WO24314			
International application No. PCT/EP99/03517	International filing date (day/month/year) 21 May 1999 (21.05.99)	Priority date (day/month/year)	
Applicant NOKIA NETWORKS OY et al			

1. The applicant is hereby informed that the International Bureau has, according to Article 31(7), notified each of the following Offices of its election:

AP : GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW

EP : AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE

National : AU, BG, CA, CN, CZ, DE, IL, JP, KP, KR, MN, NO, NZ, PL, RO, RU, SE, SK, US

2. The following Offices have waived the requirement for the notification of their election; the notification will be sent to them by the International Bureau only upon their request:

EA : AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

OA : BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

National : AE, AL, AM, AT, AZ, BA, BB, BR, BY, CH, CU, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR,
HU, ID, IN, IS, KE, KG, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MW, MX, PT, SD, SG, SI, SL,
TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW

3. The applicant is reminded that he must enter the "national phase" before the expiration of 30 months from the priority date before each of the Offices listed above. This must be done by paying the national fee(s) and furnishing, if prescribed, a translation of the international application (Article 39(1)(a)), as well as, where applicable, by furnishing a translation of any annexes of the international preliminary examination report (Article 36(3)(b) and Rule 74.1).

Some offices have fixed time limits expiring later than the above-mentioned time limit. For detailed information about the applicable time limits and the acts to be performed upon entry into the national phase before a particular Office, see Volume II of the PCT Applicant's Guide.

The entry into the European regional phase is postponed until 31 months from the priority date for all States designated for the purposes of obtaining a European patent.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35	Authorized officer: Claudio Borton Telephone No. (41-22) 338.83.38
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PATENT COOPERATION TREATY

WO 00/72518
PCT/EP99/03517

PCT

NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

From the INTERNATIONAL BUREAU

To: PELLMANN, Hans-Bernd Tiedtke-Bühling-Kinne Bavariaring 4 D-80336 München ALLEMAGNE	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> EINGEGANGEN Patentanwälte - 3. Dez. 2000 TIEDTKE · BÜHLING · KINNE & PARTNER (GmbH) </div>
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Date of mailing (day/month/year) 30 November 2000 (30.11.00)		
Applicant's or agent's file reference WO24314		IMPORTANT NOTICE
International application No. PCT/EP99/03517	International filing date (day/month/year) 21 May 1999 (21.05.99)	Priority date (day/month/year)
Applicant NOKIA NETWORKS OY et al		

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:
AU, KP, KR, US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

AE, AL, AM, AP, AT, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EA, EE, EP, ES, FI, GB, GD, GE, GH,
 GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, OA,
 PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on
 30 November 2000 (30.11.00) under No. WO 00/72518

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a **demand for international preliminary examination** must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the **national phase**, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35	Authorized officer <div style="text-align: right;">J. Zahra</div> Telephone No. (41-22) 338.83.38
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PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

To:

PELLMANN, Hans-Bernd
Tiedtke-Bühling-Kinne
Bavariaring 4
D-80336 München
ALLEMAGNE

Date of mailing (day/month/year) 18 January 2002 (18.01.02)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference WO24314	
International application No. PCT/EP99/03517	International filing date (day/month/year) 21 May 1999 (21.05.99)

1. The following indications appeared on record concerning:		
<input checked="" type="checkbox"/> the applicant	<input type="checkbox"/> the inventor	<input type="checkbox"/> the agent <input type="checkbox"/> the common representative
Name and Address NOKIA NETWORKS OY Keilalahdentie 4 FIN-02150 Espoo Finland	State of Nationality FI	State of Residence FI
	Telephone No. +358 9 1807 0	
	Facsimile No. +358 9 1807 496	
	Teleprinter No.	
2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:		
<input type="checkbox"/> the person	<input checked="" type="checkbox"/> the name	<input type="checkbox"/> the address <input type="checkbox"/> the nationality <input type="checkbox"/> the residence
Name and Address NOKIA CORPORATION Keilalahdentie 4 FIN-02150 Espoo Finland	State of Nationality FI	State of Residence FI
	Telephone No. +358 9 1807 0	
	Facsimile No. +358 9 1807 496	
	Teleprinter No.	
3. Further observations, if necessary:		
4. A copy of this notification has been sent to:		
<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned	
<input type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned	
<input type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:	

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Beate GIFFO-SCHMITT
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

To:

PELLMANN, Hans-Bernd
Tiedtke-Bühling-Kinne
Bavariaring 4
D-80336 München
ALLEMAGNE

Date of mailing (day/month/year) 06 December 1999 (06.12.99)	IMPORTANT NOTIFICATION 20 DEC 1999 PCT/EP99/03517
Applicant's or agent's file reference WO24314	
International application No. PCT/EP99/03517	International filing date (day/month/year) 21 May 1999 (21.05.99)

1. The following indications appeared on record concerning:

☒ the applicant

 ☐ the inventor

 ☐ the agent

 ☐ the common representative

Name and Address NOKIA TELECOMMUNICATIONS OY Keilalahdentie 4 FIN-02150 Espoo Finland	State of Nationality FI	State of Residence FI
	Telephone No. +358 9 1807 0	
	Facsimile No. +358 9 1807 496	
	Teleprinter No.	

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person

 ☒ the name

 ☐ the address

 ☐ the nationality

 ☐ the residence

Name and Address NOKIA NETWORKS OY Keilalahdentie 4 FIN-02150 Espoo Finland	State of Nationality	State of Residence
	Telephone No. +358 9 1807 0	
	Facsimile No. +358 9 1807 496	
	Teleprinter No.	

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

<input checked="" type="checkbox"/> the receiving Office	<input checked="" type="checkbox"/> the designated Offices concerned
<input checked="" type="checkbox"/> the International Searching Authority	<input type="checkbox"/> the elected Offices concerned
<input type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer J. Leitao Telephone No.: (41-22) 338.83.38
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PATENT COOPERATION TREATY

PCT

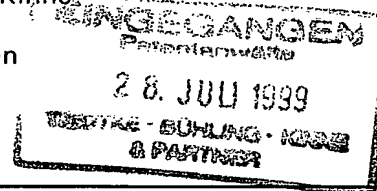
NOTIFICATION OF RECEIPT OF
RECORD COPY

(PCT Rule 24.2(a))

From the INTERNATIONAL BUREAU

To:

PELLMANN, Hans-Bernd
Tiedtke-Bühling-Kinne
Bavariaring 4
D-80336 München
ALLEMAGNE



Date of mailing (day/month/year) 21 July 1999 (21.07.99)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference WO24314	International application No. PCT/EP99/03517

The applicant is hereby notified that the International Bureau has received the record copy of the international application as detailed below.

Name(s) of the applicant(s) and State(s) for which they are applicants:

NOKIA TELECOMMUNICATIONS OY (for all designated States except US)
PUUSKARI, Mikko et al (for US)

International filing date : 21 May 1999 (21.05.99)

Priority date(s) claimed :

Date of receipt of the record copy
by the International Bureau : 06 July 1999 (06.07.99)

List of designated Offices :

AP : GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW

EA : AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

EP : AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE

OA : BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

National : AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE,
GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX,
NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW

ATTENTION

The applicant should carefully check the data appearing in this Notification. In case of any discrepancy between these data and the indications in the international application, the applicant should immediately inform the International Bureau.

In addition, the applicant's attention is drawn to the information contained in the Annex, relating to:

- ☒ time limits for entry into the national phase
☐ confirmation of precautionary designations
☐ requirements regarding priority documents

A copy of this Notification is being sent to the receiving Office and to the International Searching Authority.

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer:

J. Leftao

Telephone No. (41-22) 338.83.38

INFORMATION ON TIME LIMITS FOR ENTERING THE NATIONAL PHASE

The applicant is reminded that the "national phase" must be entered before each of the designated Offices indicated in the Notification of Receipt of Record Copy (Form PCT/IB/301) by paying national fees and furnishing translations, as prescribed by the applicable national laws.

The time limit for performing these procedural acts is **20 MONTHS** from the priority date or, for those designated States which the applicant elects in a demand for international preliminary examination or in a later election, **30 MONTHS** from the priority date, provided that the election is made before the expiration of 19 months from the priority date. Some designated (or elected) Offices have fixed time limits which expire even later than 20 or 30 months from the priority date. In other Offices an extension of time or grace period, in some cases upon payment of an additional fee, is available.

In addition to these procedural acts, the applicant may also have to comply with other special requirements applicable in certain Offices. **It is the applicant's responsibility** to ensure that the necessary steps to enter the national phase are taken in a timely fashion. Most designated Offices do not issue reminders to applicants in connection with the entry into the national phase.

For detailed information about the procedural acts to be performed to enter the national phase before each designated Office, the applicable time limits and possible extensions of time or grace periods, and any other requirements, see the relevant Chapters of Volume II of the PCT Applicant's Guide. Information about the requirements for filing a demand for international preliminary examination is set out in Chapter IX of Volume I of the PCT Applicant's Guide.

GR and ES became bound by PCT Chapter II on 7 September 1996 and 6 September 1997, respectively, and may, therefore, be elected in a demand or a later election filed on or after 7 September 1996 and 6 September 1997, respectively, regardless of the filing date of the international application. (See second paragraph above.)

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

CONFIRMATION OF PRECAUTIONARY DESIGNATIONS

This notification lists only specific designations made under Rule 4.9(a) in the request. It is important to check that these designations are correct. Errors in designations can be corrected where precautionary designations have been made under Rule 4.9(b). The applicant is hereby reminded that any precautionary designations may be confirmed according to Rule 4.9(c) before the expiration of 15 months from the priority date. If it is not confirmed, it will automatically be regarded as withdrawn by the applicant. There will be no reminder and no invitation. Confirmation of a designation consists of the filing of a notice specifying the designated State concerned (with an indication of the kind of protection or treatment desired) and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.

REQUIREMENTS REGARDING PRIORITY DOCUMENTS

For applicants who have not yet complied with the requirements regarding priority documents, the following is recalled.

Where the priority of an earlier national, regional or international application is claimed, the applicant must submit a copy of the said earlier application, certified by the authority with which it was filed ("the priority document") to the receiving Office (which will transmit it to the International Bureau) or directly to the International Bureau, before the expiration of 16 months from the priority date, provided that any such priority document may still be submitted to the International Bureau before that date of international publication of the international application, in which case that document will be considered to have been received by the International Bureau on the last day of the 16-month time limit (Rule 17.1(a)).

Where the priority document is issued by the receiving Office, the applicant may, instead of submitting the priority document, request the receiving Office to prepare and transmit the priority document to the International Bureau. Such request must be made before the expiration of the 16-month time limit and may be subjected by the receiving Office to the payment of a fee (Rule 17.1(b)).

If the priority document concerned is not submitted to the International Bureau or if the request to the receiving Office to prepare and transmit the priority document has not been made (and the corresponding fee, if any, paid) within the applicable time limit indicated under the preceding paragraphs, any designated State may disregard the priority claim, provided that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity to furnish the priority document within a time limit which is reasonable under the circumstances.

Where several priorities are claimed, the priority date to be considered for the purposes of computing the 16-month time limit is the filing date of the earliest application whose priority is claimed.

PCT REQUEST

WO24314

Original (for SUBMISSION) - printed on 21.05.1999 04:35:14 PM

0	For receiving Office use only	
0-1	International Application No.	
0-2	International Filing Date	
0-3	Name of receiving Office and "PCT International Application"	
0-4	Form - PCT/RO/101 PCT Request	
0-4-1	Prepared using	PCT-EASY Version 2.83 (updated 01.03.1999)
0-5	Petition The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	Receiving Office (specified by the applicant)	European Patent Office (EPO) (RO/EP)
0-7	Applicant's or agent's file reference	WO24314
I	Title of invention	A METHOD FOR TRANSMISSION OF PACKET DATA ACCORDING TO THEIR DELIVERY ORDER IN DIFFERENT TRAFFIC CLASSES
II	Applicant	
II-1	This person is:	applicant only
II-2	Applicant for	all designated States except US
II-4	Name	NOKIA TELECOMMUNICATIONS OY
II-5	Address:	Keilalahdentie 4 FIN-02150 Espoo Finland
II-6	State of nationality	FI
II-7	State of residence	FI
II-8	Telephone No.	+358 9 1807 0
II-9	Facsimile No.	+358 9 1807 496
III-1	Applicant and/or inventor	
III-1-1	This person is:	applicant and inventor
III-1-2	Applicant for	US only
III-1-4	Name (LAST, First)	PUUSKARI, Mikko
III-1-5	Address:	Angervotie 5 C 35 FIN-00320 Helsinki Finland
III-1-6	State of nationality	FI
III-1-7	State of residence	FI

PCT REQUEST

WO24314

Original (for SUBMISSION) - printed on 21.05.1999 04:35:14 PM

III-2	Applicant and/or inventor	
III-2-1	This person is:	applicant and inventor
III-2-2	Applicant for	US only
III-2-4	Name (LAST, First)	HURTTA, Tuija
III-2-5	Address:	Kiskottajankuja 4 D 49 FIN-02660 Espoo Finland
III-2-6	State of nationality	FI
III-2-7	State of residence	FI
III-3	Applicant and/or inventor	
III-3-1	This person is:	applicant and inventor
III-3-2	Applicant for	US only
III-3-4	Name (LAST, First)	KALLIOKULJU, Juha
III-3-5	Address:	Jokioistentie 5 FIN-37470 Vesilahti Finland
III-3-6	State of nationality	FI
III-3-7	State of residence	FI
III-4	Applicant and/or inventor	
III-4-1	This person is:	applicant and inventor
III-4-2	Applicant for	US only
III-4-4	Name (LAST, First)	MÄKELÄ, Tero
III-4-5	Address:	Seljatie 1 A 14 FIN-00320 Helsinki Finland
III-4-6	State of nationality	FI
III-4-7	State of residence	FI
IV-1	Agent or common representative; or address for correspondence	
	The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	agent
IV-1-1	Name (LAST, First)	PELLMANN, Hans-Bernd
IV-1-2	Address:	Tiedtke-Bühling-Kinne et al. Bavariaring 4 D-80336 München Germany
IV-1-3	Telephone No.	+49 89 544690
IV-1-4	Facsimile No.	+49 89 532611
IV-1-5	e-mail	postoffice tbk-patent.com

PCT REQUEST

WO24314

Original (for SUBMISSION) - printed on 21.05.1999 04:35:14 PM

IV-2	Additional agent(s)	additional agent(s) with same address as first named agent
IV-2-1	Name(s)	TIEDTKE, Harro; BÜHLING, Gerhard; KINNE, Reinhard; GRAMS, Klaus; LINK, Annette; VOLLNHALS, Aurel; LESON, Thomas, Johannes, Alois; TRÖSCH, Hans-Ludwig; CHIVAROV, Georgi; GRILL, Matthias; KÜHN, Alexander; OSER, Andreas; BÖCKELEN, Rainer
V	Designation of States	
V-1	Regional Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	AP: GH GM KE LS MW SD SZ UG ZW and any other State which is a Contracting State of the Harare Protocol and of the PCT EA: AM AZ BY KG KZ MD RU TJ TM and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT EP: AT BE CH&LI CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE and any other State which is a Contracting State of the European Patent Convention and of the PCT OA: BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG and any other State which is a member State of OAPI and a Contracting State of the PCT
V-2	National Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	AE AL AM AT AU AZ BA BB BG BR BY CA CH&LI CN CU CZ DE DK EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZA ZW
V-5	Precautionary Designation Statement In addition to the designations made under items V-1, V-2 and V-3, the applicant also makes under Rule 4.9(b) all designations which would be permitted under the PCT except any designation(s) of the State(s) indicated under item V-6 below. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit.	
V-6	Exclusion(s) from precautionary designations	NONE
VI	Priority claim	NONE
VII-1	International Searching Authority Chosen	European Patent Office (EPO) (ISA/EP)

PCT REQUEST

WO24314

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VIII	Check list	number of sheets	electronic file(s) attached
VIII-1	Request	4	-
VIII-2	Description	21	-
VIII-3	Claims	7	-
VIII-4	Abstract	1	wo24314a.txt
VIII-5	Drawings	5	-
VIII-7	TOTAL	38	
	Accompanying items	paper document(s) attached	electronic file(s) attached
VIII-8	Fee calculation sheet	✓	-
VIII-16	PCT-EASY diskette	-	diskette
VIII-18	Figure of the drawings which should accompany the abstract	3	
VIII-19	Language of filing of the international application	English	
IX-1	Signature of applicant or agent		
IX-1-1	Name (LAST, First)	PELLMANN, Hans-Bernd	

FOR RECEIVING OFFICE USE ONLY

10-1	Date of actual receipt of the purported international application	
10-2	Drawings:	
10-2-1	Received	
10-2-2	Not received	
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application	
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)	
10-5	International Searching Authority	ISA/EP
10-6	Transmittal of search copy delayed until search fee is paid	

FOR INTERNATIONAL BUREAU USE ONLY

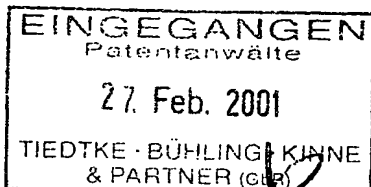
11-1	Date of receipt of the record copy by the International Bureau	
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PATENT COOPERATION TREATY

From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

LESON, Thomas, Johannes, Alois
TIEDTKE, BÜHLING, KINNE & PARTNER
Bavariaring 4
D-80336 München
ALLEMAGNE



PCT

WRITTEN OPINION

(PCT Rule 66)

BEST AVAILABLE COPY

Applicant's or agent's file reference WO 24314		REPLY DUE	within 3 month(s) from the above date of mailing
International application No. PCT/EP99/03517	International filing date (day/month/year) 21/05/1999	Priority date (day/month/year)	
International Patent Classification (IPC) or both national classification and IPC H04L12/28			
Applicant NOKIA NETWORKS OY			

- This written opinion is the **first** drawn up by this International Preliminary Examining Authority.
- This opinion contains indications relating to the following items:
 - ☒ Basis of the opinion
 - ☐ Priority
 - ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - ☐ Lack of unity of invention
 - ☐ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - ☐ Certain document cited
 - ☒ Certain defects in the international application
 - ☐ Certain observations on the international application

3. The applicant is hereby **invited to reply** to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.



Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is:

26.5.01

W/O 24314

Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer / Examiner Hamer, J	
	Formalities officer (incl. extension of time limits) Barrio Baranano, A Telephone No. +49 89 2399 8621	

I. Basis of the opinion

1. This opinion has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed".*):

Description, pages:

1-21 as originally filed

Claims, No.:

1-28 as originally filed

Drawings, sheets:

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

WRITTEN OPINION

International application No. PCT/EP99/03517

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

The claims of the application appear to meet the requirements of Articles 33(2) and (3) PCT. More details will be given in the written report. Nevertheless, the following defects are present in the application.

VII- Certain Defects

- a) If abbreviations are used in the claims, they should be enclosed in commas and not parentheses which are reserved for reference signs.
- b) The independent claims do not meet the requirements of Rule 6.3(b) PCT in that they are not divided into the two-part form. It appears that the document 'Technical Specification Group Services and System Aspects; QoS Concept (3G TR 23.907 version 1.1.0)' 3RD GENERATION PARTNERSHIP PROJECT, [Online] May 1999 (1999-05), XP002130868 Retrieved from the Internet: <URL:www.3gpp.org/TSG/June_status_list.htm > [retrieved on 2000-02-15]' should be used for this division.
- c) The documents cited in the International Search Report should be referenced and briefly discussed in the description, Rule 5.1(a)(ii), PCT.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 99/03517

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04L12/28 H04Q7/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04L H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	"Technical Specification Group Services and System Aspects; QoS Concept (3G TR 23.907 version 1.1.0)" 3RD GENERATION PARTNERSHIP PROJECT, 'Online! May 1999 (1999-05), XP002130868 Retrieved from the Internet: <URL:www.3gpp.org/TSG/June_status_list.htm > 'retrieved on 2000-02-15! page 20, line 14 -page 23, line 1 -----	1,2,4, 7-9,20
A	WO 97 22201 A (XIE DONG; CAMPBELL ROY H; CHEN ZHIGANG; TAN SEE MONG) 19 June 1997 (1997-06-19) page 6, line 4 -page 7, line 13 -----	1,7,20

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

18 February 2000

Date of mailing of the international search report

01/03/2000

Name and mailing address of the ISA
European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Ströbeck, A

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inter: International Application No

PCT/EP 99/03517

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9722201 A	19-06-1997	EP 0867003 A	30-09-1998

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

LESON, Thomas, Johannes, Alois
TIEDTKE, BÜHLING, KINNE & PARTNER
Bavariaring 4
D-80336 München
ALLEMAGNE

RECEIVED
EINGEGANGEN

23. Aug. 2001

TBK - PATENT

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Rule 71.1)

Date of mailing
(day/month/year) 21.08.2001

Applicant's or agent's file reference

WO 24314

IMPORTANT NOTIFICATION

International application No.
PCT/EP99/03517

International filing date (day/month/year)
21/05/1999

Priority date (day/month/year)

Applicant

NOKIA NETWORKS OY

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

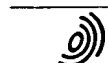
4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized officer

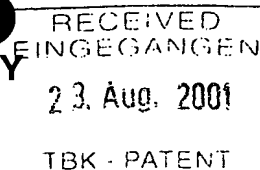
Ahrens, R

Tel. +49 89 2399-8136




PATENT COOPERATION TREATY

PCT



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference WO 24314		FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP99/03517	International filing date (day/month/year) 21/05/1999	Priority date (day/month/year)	
International Patent Classification (IPC) or national classification and IPC H04L12/28			
Applicant NOKIA NETWORKS OY			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 9 sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application 			
Date of submission of the demand 20/12/2000		Date of completion of this report 21.08.2001	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized officer Hamer, J Telephone No. +49 89 2399 8827	



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP99/03517

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-3,6-21 as originally filed

4,5 as received on 26/06/2001 with letter of 26/06/2001

Claims, No.:

1-28 as received on 26/06/2001 with letter of 26/06/2001

Drawings, sheets:

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP99/03517

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-28
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-28
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-28
	No:	Claims	

2. Citations and explanations
see separate sheet

V- Reasoned Statement

1. The subject-matter of claim 1 is concerned with a method for setting a delivery order attribute as a parameter for transmission of data packets in a packet data network. Document D1, which is considered to be closest available prior art, discloses four classes of traffic and also defines a delivery order parameter which indicates whether the packets must be provided in-sequence or not. D1 expressly states that the delivery order parameter cannot be defined from the traffic class. If the parameter is set, this could lead to disadvantages such as the necessity for a node or network element of the network having to rearrange the received disordered data packets in order to reconstruct the data packets as they were sent. Thus a decision must be taken by the user as to whether the parameter should be set or not. A user may, however, have no idea whether to set the parameter or not. It is this problem which the application sets out to solve. To this end in claim 1, the method establishes mapping information for delivery attributes corresponding to different transmission type protocols. If the transmission protocol is not of a certain type, this mapping information is used to set the delivery order attribute. As mentioned above, D1 specifically mentions that no connection can be made between the traffic class and the delivery order attribute. D2 is concerned with the transmission of real time video and audio signals, but does not mention a delivery order attribute.

Thus the features of claim 1 are not found in any of the available documents, its subject matter involves an inventive step and the claim meets the requirements of Article 33(3) PCT.

2. The subject-matter of independent claims 7 and 20 is concerned with a method for transmission of data packets in a packet network and for a network element for controlling transmission of data packets in a packet data network respectively. In these claims it is ascertained whether the delivery order attribute parameter is set and from this the traffic class of the packets is determined. The packets are then processed according to this information. As discussed above, none of the available prior art documents link the traffic class with the delivery order attribute parameter. As a result, claims 7 and 20 also involves an inventive step and meet the requirements of Article 33(3) PCT.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP99/03517

3. The subject-matter of dependent claims 2 to 6, 8 to 19 and 21 to 28 includes features which further restrict the scope of claims 1, 7 and 20 respectively. As a result, these claims also meet the requirements of Articles 33(2) and (3) PCT.

types. However, different applications will require a respective different service from the network.

For example, the X.25 protocol requires the data packets to
5 be sent reliable and delivered in-order, i.e. in the same
sequence as they were initially transmitted/forwarded. PPP
protocol, on the other hand, requires a less reliable
transmission, i.e. some data packets can be lost without
significantly affecting QoS, but the data packets not lost
10 have to be delivered in-sequence. Still further, IP
protocol based transmissions do neither have to preserve
the order of the sent packets nor to be reliable in the
sense that no data packets are to be lost.

15 For this purpose, a delivery order attribute as a PDP
context QoS parameter has recently been defined. To be
included in a set of UMTS bearer QoS parameters. These
parameters are still subject to a non-concluded
standardization process.

20

The delivery order attribute parameter (DOA) defines for
UMTS if the order of transmitted packets has to be
maintained or not. In case the order is to be maintained,
this leads to the necessity of a node or network element of
25 the network (GPRS comparable part of UMTS) to rearrange the
received (disordered) data packets to thereby reconstruct
the initial sequence of the data packets as they were sent.

However, this additional parameter is hard to define by an
30 end-user who can be expected not to be an expert in
telecommunication networks. Namely, such a "normal" end-

- 5 -

user presumably does not know whether such a property (of in-order packets) is necessary for an activated service and/or how the property affects the operation.

5 Moreover, in order to support different applications on top of the UMTS bearer, four traffic classes have been developed. Namely, a conversational, streaming, interactive and background traffic class, respectively.

10 PDP types mentioned above are independent of the traffic classes. Stated in other words, each PDP type (protocol type) may run over several traffic classes. IN addition, the selection of traffic class sets some requirements for the handling of the prevailing traffic in terms of
15 scheduling and/or buffering of transmitted data packets. Also, a delivery order is defined in each traffic class, but this is currently not in line with the requirements imposed to the traffic classes.

20 SUMMARY OF THE INVENTION

Hence, it is an object of the present invention to optimize data packet transmission for different service while simplifying a user interface required for configuring
25 services available to a user.

According to a first aspect of the present invention, this object is achieved by a method for setting a delivery order attribute as a parameter for transmission of data packets
30 in a packet data network, said method comprising the steps of: establishing mapping information for delivery order

CLAIMS

1. A method for setting a delivery order attribute (DOA) as
a parameter for transmission of data packets in a packet
5 data network (GPRS-NW),
said method comprising the steps of:

establishing mapping information for delivery order
attributes corresponding to different transmission protocol
types;

10 detecting (S22) a transmission protocol type for the
transmission of data packets,

deciding (S23) whether said detected protocol type is
a predetermined type, and

15 setting (S24), based on said mapping information and
said decision result, the delivery order attribute (DOA) in
case the predetermined protocol type is decided to be not
present.

2. A method according to claim 1, wherein said set
20 delivery order attribute (DOA) indicates that the order of
transmitted data packets is to be maintained.

3. A method according to claim 1, wherein said delivery
order attribute (DOA) is not set (S25) in case the
25 predetermined protocol type is decided to be present.

4. A method according to claim 3, wherein said
delivery order attribute being not set indicates that the
order of transmitted data packets does not need to be
30 maintained.

5. A method according to claim 1, wherein said predetermined protocol type is a protocol type used for real-time transmission.

5 6. A method according to claim 1, wherein said transmission protocol type is derived from PDP context information or PDP type information.

7. A method for transmission of data packets in a packet data network, said method comprising the steps of:
10 detecting (S31) at least a delivery order attribute (DOA) as a parameter for transmission of data packets;
deciding (S32), whether said delivery order attribute parameter is set; and if so
15 determining (S34) a traffic class of the transmitted data packets, and
processing (S35-S39, S310-S315) the transmitted data packets dependent on the determined traffic class.

20 8. A method according to claim 7, wherein if said delivery order attribute is set, this indicates that the order of transmitted data packets is to be maintained.

9. A method according to claim 7, wherein if said
25 delivery order attribute is not set, this indicates that the order of transmitted data packets does not need to be maintained.

10. A method according to claim 9, wherein data packets to
30 be transmitted are forwarded (S33) to their destination immediately and irrespective of the traffic class.

11. A method according to claim 7 or 8, further comprising the steps of:

deciding (S35) whether a determined traffic class is a
5 predetermined traffic class, and if so

discarding (S36) those of received data packets which are received after subsequently sent data packets.

12. A method according to claim 7 or 8, further comprising
10 the steps of:

deciding (S35) whether a determined traffic class is a predetermined traffic class, and if not so

monitoring (S37) a sequential relationship among received data packets,

15 detecting (S38) whether a data packet is missing in the monitored sequence, and

in response to the detection of a missing data packet, buffering (S311) received data packets.

20 13. A method according to claim 12, further comprising a step of

setting (S310) a buffering time window, during which time window received data packets are buffered.

25 14. A method according to claim 13, further comprising a step of

checking (S314) whether the missing data packet is received during the buffering time window.

30 15. A method according to claim 14, wherein

if said missing data packet is not received during the buffering time window (S314, S312),

5 said buffered data packets are forwarded (S313) irrespective of the missing data packet, which is discarded even if received after the buffering time window.

16. A method according to claim 14, wherein

if said missing data packet is not received during the buffering time window (S314, S312),

10 said buffered data packets are forwarded (S313) irrespective of the missing data packet, which is delivered out of sequence even if received after the buffering time window.

15 17. A method according to claim 14, wherein

if said missing data packet is received (S314) during the buffering time window,

20 said buffered data packets are reordered to their initial sequence order and forwarded in their initial sequence order (S315).

18. A method according to claim 17, wherein

25 said reordering is based on sequence numbers of the packets contained in headers of the packets.

19. A method according to claim 18, wherein

said headers are GTP (GTP = GPRS Tunneling Protocol) headers, RLC (Radio Link Control) headers, LLC (Logical Link Control) headers or SNDCP headers of the packets.

20. A network element for controlling transmission of data packets in a packet data network, said network element comprising:

5 first detecting means adapted to detect at least a delivery order attribute (DOA) as a parameter for transmission of data packets;

first deciding means adapted to decide whether said delivery order attribute parameter is set;

10 first determining means responsive to a positive decision result and adapted to determine a traffic class of the transmitted data packets, and

processing means adapted to process the transmitted data packets dependent on the determined traffic class.

15 21. A network element according to claim 20, wherein said processing means further comprises:

second deciding means adapted to decide whether a determined traffic class is a predetermined traffic class, and

20 discarding means responsive to a positive result of said second deciding means and adapted to discard those of received data packets which are received after subsequently sent data packets.

25 22. A network element according to claim 20, wherein said processing means further comprises:

second deciding means adapted to decide whether a determined traffic class is a predetermined traffic class, and

monitoring means responsive to a negative result of said deciding means and adapted to monitor a sequential relationship among received data packets,

second detecting means adapted to detect whether a
5 data packet is missing in the monitored sequence, and
buffer means responsive to the detection of a missing data packet and adapted to buffer received data packets.

23. A network element according to claim 22, wherein said
10 processing means further comprises:

setting means adapted to set a buffering time window, during which time window received data packets are buffered.

15 24. A network element according to claim 23, wherein said processing means further comprises:

checking means adapted to check whether the missing data packet is received during the buffering time window.

20 25. A network element according to claim 24, wherein said processing means further comprises:

forwarding means adapted to forward,

if said missing data packet is not received during the buffering time window,

25 said buffered data packets irrespective of the missing data packet, and to discard the missing data packet even if received after the buffering time window.

26. A network element according to claim 24, wherein said
30 processing means further comprises:

reordering means adapted to reorder,

- 28 -

if said missing data packet is received during the buffering time window,

said buffered data packets to their initial sequence order, and to forward the buffered data packets in
5 their initial sequence order.

27. A network element according to any of the preceding claims 20 to 26, wherein said network element is a radio network controller (RNC) controlling the transmission of
10 data packets in a packet data network in downlink direction.

28. A network element according to any of the preceding claims 20 to 26, wherein said network element is a GGSN
15 (Gateway GPRS Support Node) controlling the transmission of data packets in a packet data network in uplink direction.

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43. and 44)

Applicant's or agent's file reference WO 24314	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/EP 99/ 03517	International filing date (day/month/year) 21/05/1999	(Earliest) Priority Date (day/month/year)
Applicant NOKIA NETWORKS OY		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

PACKET DATA TRANSMISSION IN THIRD GENERATION MOBILE SYSTEM

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☒ because this figure better characterizes the invention.

2

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/EP 99/03517

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04L12/28 H04Q7/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04L H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	"Technical Specification Group Services and System Aspects; QoS Concept (3G TR 23.907 version 1.1.0)" 3RD GENERATION PARTNERSHIP PROJECT, 'Online! May 1999 (1999-05), XP002130868 Retrieved from the Internet: <URL:www.3gpp.org/TSG/June_status_list.htm > 'retrieved on 2000-02-15! page 20, line 14 -page 23, line 1 -----	1,2,4, 7-9,20
A	WO 97 22201 A (XIE DONG; CAMPBELL ROY H; CHEN ZHIGANG; TAN SEE MONG) 19 June 1997 (1997-06-19) page 6, line 4 -page 7, line 13 -----	1,7,20

☐ Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

18 February 2000

Date of mailing of the international search report

01/03/2000

Name and mailing address of the ISA

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Authorized officer

Ströbeck, A

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 99/03517

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9722201 A	19-06-1997	EP 0867003 A	30-09-1998

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June 26, 2001

PCT Patent Application No.: PCT/EP99/03517

NOKIA NETWORKS OY

Our ref.: WO 24314

(F:26.06.Eing.)

Reference is made to the Written Opinion pursuant to Rule
66 PCT, dated February 26, 2001.

Enclosed herewith the following documents are filed:

- amended new claims 1 to 28,
- revised specification pages 4, 5

Following the Examiner's suggestion, the independent claims
1, 7 and 20 have now been delimited against the disclosure
of the document 3GPP, Technical Specification Group
Services and System Aspects, QoS Concept (3G TR 23.907
version 1.1.0), May 1999.

Furthermore, with regard to claim 19, abbreviation
explanations have now been enclosed in commas and not in
parentheses.

Still further, the revised specification pages 4 and 5 now
include an acknowledgment of the documents cited in the
International Search Report.

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Thus, taking account of the amendments as filed herewith,
an issuance of a favorable International Preliminary
Examination Report is now expected as the next stage of the
proceedings.

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Enclosures (in triplicate):

- new claims 1 to 28
- specification pages 4, 5

Enclosure of June 26, 2001

PCT Patent Application No.: PCT/EP99/03517
NOKIA NETWORKS OY
Our ref.: WO 24314

5

Amended New Claims

10

CLAIMS

1. A method for setting a delivery order attribute (DOA) as
a parameter for transmission of data packets in a packet
15 data network (GPRS-NW),
said method being characterized by comprising the steps of:
 establishing mapping information for delivery order
 attributes corresponding to different transmission protocol
 types;
20 detecting (S22) a transmission protocol type for the
 transmission of data packets,
 deciding (S23) whether said detected protocol type is
 a predetermined type, and
 setting (S24), based on said mapping information and
25 said decision result, the delivery order attribute (DOA) in
 case the predetermined protocol type is decided to be not
 present.

2. A method according to claim 1, wherein said set
30 delivery order attribute (DOA) indicates that the order of
transmitted data packets is to be maintained.

3. A method according to claim 1, wherein said delivery
order attribute (DOA) is not set (S25) in case the
35 predetermined protocol type is decided to be present.

4. A method according to claim 3, wherein said

delivery order attribute being not set indicates that the order of transmitted data packets does not need to be maintained.

5 5. A method according to claim 1, wherein said predetermined protocol type is a protocol type used for real-time transmission.

6. A method according to claim 1, wherein said transmission
10 protocol type is derived from PDP context information or PDP type information.

7. A method for transmission of data packets in a packet data network, said method comprising the steps of:
15 detecting (S31) at least a delivery order attribute (DOA) as a parameter for transmission of data packets;
further characterized by the steps of
deciding (S32), whether said delivery order attribute parameter is set; and if so
20 determining (S34) a traffic class of the transmitted data packets, and
processing (S35-S39, S310-S315) the transmitted data packets dependent on the determined traffic class.

25 8. A method according to claim 7, wherein if said delivery order attribute is set, this indicates that the order of transmitted data packets is to be maintained.

9. A method according to claim 7, wherein if said
30 delivery order attribute is not set, this indicates that the order of transmitted data packets does not need to be maintained.

10. A method according to claim 9, wherein data packets to be transmitted are forwarded (S33) to their destination immediately and irrespective of the traffic class.

5 11. A method according to claim 7 or 8, further comprising the steps of:

deciding (S35) whether a determined traffic class is a predetermined traffic class, and if so

discarding (S36) those of received data packets which
10 are received after subsequently sent data packets.

12. A method according to claim 7 or 8, further comprising the steps of:

deciding (S35) whether a determined traffic class is a
15 predetermined traffic class, and if not so

monitoring (S37) a sequential relationship among received data packets,

detecting (S38) whether a data packet is missing in the monitored sequence, and

20 in response to the detection of a missing data packet, buffering (S311) received data packets.

13. A method according to claim 12, further comprising a step of

25 setting (S310) a buffering time window, during which time window received data packets are buffered.

14. A method according to claim 13, further comprising a step of

30 checking (S314) whether the missing data packet is received during the buffering time window.

15. A method according to claim 14, wherein

if said missing data packet is not received during the buffering time window (S314, S312),

said buffered data packets are forwarded (S313) irrespective of the missing data packet, which is discarded
5 even if received after the buffering time window.

16. A method according to claim 14, wherein

if said missing data packet is not received during the buffering time window (S314, S312),

10 said buffered data packets are forwarded (S313) irrespective of the missing data packet, which is delivered out of sequence even if received after the buffering time window.

15 17. A method according to claim 14, wherein

if said missing data packet is received (S314) during the buffering time window,

said buffered data packets are reordered to their initial sequence order and forwarded in their initial
20 sequence order (S315).

18. A method according to claim 17, wherein

said reordering is based on sequence numbers of the packets contained in headers of the packets.
25

19. A method according to claim 18, wherein

said headers are GTP headers, GTP = GPRS Tunneling Protocol, RLC headers, RLC = Radio Link Control, LLC headers, LLC = Logical Link Control or SNDCP headers of the
30 packets.

20. A network element for controlling transmission of data packets in a packet data network, said network element comprising:

first detecting means adapted to detect at least a delivery order attribute (DOA) as a parameter for transmission of data packets;

characterized by

5 first deciding means adapted to decide whether said delivery order attribute parameter is set;

first determining means responsive to a positive decision result and adapted to determine a traffic class of the transmitted data packets, and

10 processing means adapted to process the transmitted data packets dependent on the determined traffic class.

21. A network element according to claim 20, wherein said processing means further comprises:

15 second deciding means adapted to decide whether a determined traffic class is a predetermined traffic class, and

discarding means responsive to a positive result of said second deciding means and adapted to discard those of received data packets which are received after subsequently sent data packets.

22. A network element according to claim 20, wherein said processing means further comprises:

25 second deciding means adapted to decide whether a determined traffic class is a predetermined traffic class, and

monitoring means responsive to a negative result of said deciding means and adapted to monitor a sequential relationship among received data packets,

30 second detecting means adapted to detect whether a data packet is missing in the monitored sequence, and

buffer means responsive to the detection of a missing data packet and adapted to buffer received data packets.

23. A network element according to claim 22, wherein said processing means further comprises:

5 setting means adapted to set a buffering time window,
during which time window received data packets are buffered.

24. A network element according to claim 23, wherein said processing means further comprises:

10 checking means adapted to check whether the missing data packet is received during the buffering time window.

25. A network element according to claim 24, wherein said processing means further comprises:

15 forwarding means adapted to forward,
if said missing data packet is not received during the buffering time window,
said buffered data packets irrespective of the missing data packet, and to discard the missing data packet
20 even if received after the buffering time window.

26. A network element according to claim 24, wherein said processing means further comprises:

reordering means adapted to reorder,
25 if said missing data packet is received during the buffering time window,
said buffered data packets to their initial sequence order, and to forward the buffered data packets in their initial sequence order.

30

27. A network element according to any of the preceding claims 20 to 26, wherein said network element is a radio network controller (RNC) controlling the transmission of data packets in a packet data network in downlink

35 direction.

28. A network element according to any of the preceding
claims 20 to 26, wherein said network element is a GGSN
(Gateway GPRS Support Node) controlling the transmission of
5 data packets in a packet data network in uplink direction.

types. However, different applications will require a respective different service from the network.

For example, the X.25 protocol requires the data packets to
5 be sent reliable and delivered in-order, i.e. in the same
sequence as they were initially transmitted/forwarded. PPP
protocol, on the other hand, requires a less reliable
transmission, i.e. some data packets can be lost without
significantly affecting QoS, but the data packets not lost
10 have to be delivered in-sequence. Still further, IP
protocol based transmissions do neither have to preserve
the order of the sent packets nor to be reliable in the
sense that no data packets are to be lost.

15 For this purpose, a delivery order attribute as a PDP
context QoS parameter has recently been defined. To be
included in a set of UMTS bearer QoS parameters. These
parameters are still subject to a non-concluded
standardization process. *A delivery order attribute is defined in*
20 *3GPP, Technical Specification Group Services and System Aspects,*
QoS concept (3G TR 23.907; May 1999, Version 1.1.0). <->
The delivery order attribute parameter (DOA) defines for
UMTS if the order of transmitted packets has to be
maintained or not. In case the order is to be maintained,
this leads to the necessity of a node or network element of
25 the network (GPRS comparable part of UMTS) to rearrange the
received (disordered) data packets to thereby reconstruct
the initial sequence of the data packets as they were sent.

However, this additional parameter is hard to define by an
30 end-user who can be expected not to be an expert in
telecommunication networks. Namely, such a "normal" end-

*<(This document has been referred to when drafting the appended
independent claims in two-part form.) >*

user presumably does not know whether such a property (of in-order packets) is necessary for an activated service and/or how the property affects the operation.

5 Moreover, in order to support different applications on top of the UMTS bearer, four traffic classes have been developed. Namely, a conversational, streaming, interactive and background traffic class, respectively.

10 PDP types mentioned above are independent of the traffic classes. Stated in other words, each PDP type (protocol type) may run over several traffic classes. IN addition, the selection of traffic class sets some requirements for the handling of the prevailing traffic in terms of
15 scheduling and/or buffering of transmitted data packets. Also, a delivery order is defined in each traffic class, but this is currently not in line with the requirements imposed to the traffic classes.

Further prior art is known from document WO 97/222 01.

20 SUMMARY OF THE INVENTION

Hence, it is an object of the present invention to optimize data packet transmission for different service while simplifying a user interface required for configuring
25 services available to a user.

According to a first aspect of the present invention, this object is achieved by a method for setting a delivery order attribute as a parameter for transmission of data packets
30 in a packet data network, said method comprising the steps of: establishing mapping information for delivery order

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